Ebola Hemorrhagic Fever

Report Immediately

March 2004 HighPoint

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Etiologic Agent

Ebola hemorrhagic fever (EHF) belongs to a group of viral hemorrhagic fevers (VHFs) including numerous zoonotic diseases, all of which cause a hemorrhagic syndrome in humans. EHF is caused by a filovirus. Because of its extremely high case-fatality ratio and the potential importation of the virus into the United States in non-human primates, EHF has been most publicized in the United States. VHFs have been recognized by the Centers for Disease Control and Prevention (CDC) as being among the top agents of concern for potential bioterrorist weapons.

B. Clinical Description and Laboratory Diagnosis

The onset of EHF is usually sudden. Patients may present with a brief prodrome characterized by nonspecific signs, including fever, headache, malaise, weakness, irritability, dizziness and muscle aches, followed by pharyngitis, vomiting, diarrhea and maculopapular rash. As signs become more serious, the patient becomes prostrate and may develop pain in the throat, chest, or abdomen, as well as petechiae and ecchymoses (bruises). Bleeding occurs from mucous membranes manifested by nosebleeds and bleeding gums, and blood in vomit, urine, stools and sputum. The patient will often go into shock. Encephalopathy, hepatitis, intention tremors, and reduced white blood cell and platelet levels are frequently seen, and renal failure may occur. Case-fatality ratio for EHF varies from 50% to 90%.

Laboratory confirmation is based upon identifying the presence of specific antibodies in blood, serum or organ homogenates, or by detection of virus antigen in clinical specimen by polymerase chain reaction (PCR), and by virus isolation in cell culture. **Laboratory studies represent an extreme biohazard and should be conducted only where protection against infection of the staff and community is available.**

C. Reservoirs

Unknown despite extensive studies.

D. Modes of Transmission

Human infection of the index case has always occurred in rural areas of Africa or through contact with infected non-human primates. No common event has been identified among human index cases although proximity to bats and local travel is frequently mentioned. Once a human has acquired infection with Ebola virus, person-to-person transmission may occur. Persons become infected through contact with infectious blood or secretions from infected persons or animals. Individuals have acquired Ebola through sexual contact. Bedding or other fomites may serve as a source of infection. Medical equipment that has not been properly cleaned or sterilized has been responsible for the spread of EHF, and rare cases have been acquired by laboratory workers manipulating specimens.

E. Incubation Period

The incubation periods for EHF range from 2 to 21 days, with an average of 5 to 10 days.

F. Period of Communicability or Infectious Period

Infected individuals are generally considered infectious for a variable period preceding the onset of symptoms and during the course of clinical symptoms. Virus may remain in the blood and secretions for months after an individual recovers. Contaminated bedding and medical equipment may remain infectious for several days.

G. Epidemiology

Ebola virus was recognized in the western equatorial province of the Sudan, in Zaire, and Cote d'Ivore. The Reston Ebola subtype has been identified in Philippines. Outbreaks of EHF in imported non-human primates used for research have occurred in the United States. In one instance, individuals working with infected primates developed antibody to Ebola, suggesting exposure, but the individuals did not become clinically ill. There is speculation that this particular strain of Ebola virus (Reston Ebola) may be unable to cause clinical disease in humans.

H. Bioterrorist Potential

The viruses that cause VHFs including Ebola virus are considered potential bioterrorist agents. If acquired and properly disseminated, these viruses could cause a serious public health challenge in terms of ability to limit the numbers of casualties and control other repercussions from such an attack.

2) REPORTING CRITERIA AND LABORATORY TESTING SERVICES

A. New Jersey Department of Health and Senior Services (NJDHSS) Case Definition

Report any case or suspected case by a healthcare provider of Ebola hemorrhagic fever and any potential exposure to Ebola virus.

B. Laboratory Testing Services Available

The Public Health and Environmental Laboratories (PHEL) do not provide testing for Ebola virus. Arrangements can be made through PHEL for appropriate sample types to be sent to the Centers for Disease Control and Prevention (CDC) for diagnostic testing. Contact the PHEL at 609.984.2622 for more information.

3) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify potential sources of transmission which may exist in the United States (such as non-human primates or laboratory specimens).
- To identify sources of transmission and geographical areas of risk outside of the United States.
- To stop transmission from such sources and geographical areas.
- To identify cases as early as possible to prevent transmission to other persons or animals.
- To identify cases and clusters of human illness that may be associated with a bioterrorist event.

B. Laboratory and Healthcare Provider Reporting Requirements

The NJDHSS requests that healthcare providers **immediately report** any suspect case of EHF, or any potential exposure to an agent, which could cause EHF to the local health officer having jurisdiction over the locality in which the patient lives. If this is not possible, call the NJDHSS Infectious and Zoonotic Diseases Program (IZDP) at 609.588.7500 during business hours, or 609.392.2020 after business hours, on weekends and holidays. Telephone reports shall be followed up by a written or electronic report (using the Communicable Disease Reporting System [CDRS]) within the 24 hours of the initial report.

Note: Since the CDC is the principal testing laboratory for VHFs including EHF in the United States, any cases in New Jersey residents would be reported to NJDHSS by CDC, and the Department would, in turn, notify the local health officer in the community where the patient resides.

B. Local Departments of Health Reporting and Follow-Up Responsibilities.

1 Reporting Requirements

The New Jersey Administrative Code (N.J.A.C. 8:57-1.8) stipulates that each local health officers must report the occurrence of any case or suspected case of EHF, as defined by the reporting criteria in Section 2 A above. Current requirements are that cases be **immediately reported** to the NJDHSS IZDP.

2. Case Investigation

a. **The most important step a local health officer can take if he/she learns of a suspect or confirmed case of EHF, or any potential exposure to an agent which could cause EHF, is to call the NJDHSS IZDP immediately, any time of the day or night.** The phone number of the IZDP is 609.588.7500 during business hours, and 609.392.2020, after business hours, on weekends and holidays.

b. The NJDHSS IZDP will direct the case investigation of New Jersey residents in conjunction with the CDC. If a bioterrorist event is suspected, the NJDHSS and other authorities will work closely with the local health officer and provide instructions/information on how to proceed.

c. Following immediate notification of the NJDHSS, the local health officer may be asked to assist in investigating any patient living within the community, including gathering the following:
   1) The patient's name, age, address, phone number, status (hospitalized, at home, deceased), and parent/guardian information, if applicable.
   2) The name and phone number of the hospital where the patient is or was hospitalized.
   3) The name and phone number of the patient's attending physician.
   4) The name and phone number of the infection control official at the hospital.
   5) If the patient was seen by a healthcare provider before hospitalization, or seen at more than one hospital, these names and phone numbers will be needed as well.

d. The local health officer(s) may be asked to assist in completing CDS-1 Reporting form. The report may also be filed electronically over the Internet using the CDRS. Most of the information required on the form can be obtained from the healthcare provider or the medical record. Use the following guidelines in completing the form:
   1) Record "Ebola hemorrhagic fever" as the disease being reported.
   2) Record the case-patient's demographic information.
   3) Record the date of symptom onset, symptoms, date of diagnosis, hospitalization information (if applicable), and outcome of disease (*e.g.*, recovered, died).
   4) Exposure history: Use the incubation period range for EHF (2–21 days, average 5 to 10 days). Specifically, focus on the period beginning a minimum of 2 days prior to the patient's onset date back to no more than 16 days before onset for travel history; determine the date(s) and geographic area(s) traveled to by the case-patient to identify where the patient may have become infected.
   5) Complete the important history of travel section to indicate where EHF was acquired. If unsure, check "Unknown."
   6) Include any additional comments regarding the patient.
   7) If there have been several attempts to obtain patient information (*e.g.*, the patient or healthcare provider does not return calls or respond to a letter, or the patient refuses to divulge information or is too ill to be interviewed), please fill out the form with as much information as possible. Please note on the form the reason why it could not be filled out completely. **If CDRS is used to report, enter collected information into the "Comments" section.**

d. After completing the form, it should be faxed to the NJDHSS IZDP (fax number 609.631.4863), or the report can be filed electronically over the Internet using the confidential and secure CDRS. Call the IZDP at 609.588.7500 to confirm receipt of your fax.

e. Institution of disease control measures is an integral part of case investigation. It is the local health officer's responsibility to understand, and, if necessary, institute the control guidelines listed below in Section 4, "Controlling Further Spread."

4) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements (N.J.A.C. 8:57-1.10)

Minimum Period of Isolation of Patient
Patients should be isolated until they are clinically well, and then monitored. Because blood and secretions may contain virus for up to several months, patients must be educated and monitored for infectiousness. Intimate contacts should be cautions and condoms should be used during sex for 3 months. For more detailed recommendations see "Management of Patients with Suspected Viral Hemorrhagic Fever—United States" available at MMWR 1995:44(25);475-479.

Minimum Period of Quarantine of Contacts
See Section 4, "Protection of Contacts of a Case," directly below.

B. Protection of Contacts of a Case

There is no immunization or prophylaxis for contacts of cases. Healthcare workers and other contacts of known or suspected cases of EHF should practice standard (including respiratory) precautions together with contact precautions to reduce their chances of acquiring EHF. Their healthcare provider should monitor individuals who have had any contact with infectious patients for the maximum 21 days. The monitoring should include checking body temperature at least 2 times daily for at least 3 weeks after last exposure. In a case of temperature greater than 38.3 C (101 F), the sick person should be immediately hospitalized in a strict isolated facility.

C. Managing Special Situations

Reported Incidence Is Higher than Usual/Outbreak Suspected
If an outbreak is suspected, primary investigation will be handled by the NJDHSS in conjunction with the CDC. A source of infection, such as travel to a geographical region where a known outbreak of EHF is occurring, will be sought and applicable preventive or control measures will be instituted. The NJDHSS can determine a course of action to prevent further cases and can perform surveillance for cases across jurisdictions and therefore be difficult to identify at a local level. The local health officer may be asked to assist in the investigation to help determine the source of infection and to implement any necessary control measures.

Note: If a bioterrorist event is suspected, the NJDHSS and other response authorities will work closely with local health officers and provide instructions/information on how to proceed.

D. Preventive Measures

Environmental Measures
No environmental measures are necessary; EHF does not occur naturally in United States.

Personal Preventive Measures/Education

To avoid cases of EHF:

- Avoid traveling to areas with known outbreaks of EHF.
- Laboratory workers handling specimens suspected of containing the agents of EHF must take appropriate precautions.
- Persons working with imported non-human primates (NHPs) should know the signs of EHF in non-human primates (NHPs); and **immediately report** any cases of suspect or confirmed EHF in NHPs to the NJDHSS.

ADDITIONAL INFORMATION

For more information regarding international travel and EHF, contact the CDC's Traveler's Health Office at 877.394.8747 or through the Internet at <http://www.cdc.gov/travel>.

There is no formal CDC case definition for EHF. CDC case definitions are used by state health departments and CDC to maintain uniform standards for national reporting. For reporting a case to the NJDHSS, always refer to criteria in Section 2 A of this chapter.

REFERENCES

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